

Having described the invention, the following is claimed:

1. Apparatus for helping to protect an occupant of a vehicle that has a side structure and a roof, said apparatus comprising:

an inflatable curtain that is inflatable away from the roof between the side structure of the vehicle and a vehicle occupant, said inflatable curtain having an inflatable volume;

an inflator actuatable to provide inflation fluid for inflating said inflatable curtain;

a first fill tube having a portion positioned in a first portion of said inflatable volume;

a second fill tube having a portion positioned in a second portion of said inflatable volume; and

an inflation fluid distribution manifold connectable with said inflator, said manifold comprising a first flow orifice that directs inflation fluid to flow into said first fill tube at a first flow rate and a second flow orifice that directs inflation to fluid flow into said second fill tube at a second flow rate different than said first flow rate.

2. The apparatus recited in claim 1, wherein said manifold comprises:

a main fluid passage;

a collar portion connectable with said inflator  
5 to provide fluid communication between said inflator and  
said main fluid passage;

a first distribution portion connectable with  
said first fill tube, said first distribution portion  
providing fluid communication between said first fill  
10 tube and said main fluid passage, said first distribution  
portion including said first flow orifice; and

a second distribution portion connectable with  
said second fill tube, said second distribution portion  
providing fluid communication between said second fill  
15 tube and said main fluid passage, said second  
distribution portion including said second flow orifice.

3. The apparatus recited in claim 2, wherein said  
inflator comprises a container and an outlet assembly,  
20 said outlet assembly comprising an outlet flow area and  
means actuatable to release inflation fluid to flow from  
said container through said outlet flow area, said collar  
portion being connectable with said outlet assembly to

provide fluid communication between said main fluid passage and said outlet flow area.

4. The apparatus recited in claim 3, wherein said  
5 outlet assembly comprises a diffuser having a generally cylindrical configuration, said collar portion having a generally cylindrical surface for mating with and clamping onto said diffuser to connect said manifold to said inflator.

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5. The apparatus recited in claim 4, wherein said outlet flow area of said outlet assembly comprises first and second outlet apertures positioned radially opposite each other about said diffuser, said main fluid passage  
15 being positioned adjacent said first outlet aperture when said collar portion is connected with said diffuser, said collar portion including a protuberance positioned opposite said main fluid passage and extendable into said second outlet aperture when said collar portion is  
20 connected with said diffuser.

6. The apparatus recited in claim 2, wherein said collar portion comprises:

a first collar part having an inner surface;  
a second collar part separate from said first collar part, said second collar part having an inner surface; and

5 fastening means for connecting said first and second collar parts with each other, said inner surfaces of said first and second collar parts together defining a clamping surface of said collar portion when said first and second collar parts are connected with each other.

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7. The apparatus recited in claim 6, wherein said clamping surface extends around and clamps onto an outer surface of said inflator when said first and second collar parts are connected with each other.

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8. The apparatus recited in claim 6, wherein each of said inner surfaces of said first and second collar parts has a generally semi-cylindrical configuration, said clamping surface having a generally cylindrical configuration when said first and second collar parts are  
20 connected with each other.

9. The apparatus recited in claim 2, wherein said manifold has a generally T-shaped configuration, said main fluid passage extending along a first axis, said first and second distribution portions extending in  
5 opposite directions along a second axis perpendicular to said first axis from a first end of said main fluid passage.

10. The apparatus recited in claim 9, wherein said  
10 collar portion comprises:

a first collar part formed at a second end of said main fluid passage opposite said first end, said first collar part having a semi-cylindrical inner surface;

15 a second collar part separate from said first collar part, said second collar part having a semi-cylindrical inner surface; and

fastening means for connecting said first and second collar parts with each other, said semi-cylindrical surfaces of said first and second collar  
20 parts together defining a cylindrical inner surface of said collar portion when said first and second collar parts are connected with each other.

11. The apparatus recited in claim 10, wherein said first collar part includes an aperture that provides fluid communication with said main fluid passage through said inner surface of said first collar portion.

12. The apparatus recited in claim 11, wherein said inflator comprises first and second outlet apertures positioned opposite each other, said aperture of said first collar part being positioned adjacent said first outlet aperture when said collar portion is connected with said inflator, said second part including a protuberance extendable into said second outlet aperture when said collar portion is connected with said inflator.

13. The apparatus recited in claim 2, wherein said manifold has a generally S-shaped configuration, said main fluid passage having a first portion extending from said collar portion in a first direction along a first axis, said main fluid passage having a second portion extending from said collar portion in a second direction opposite said first direction along said first axis, said first distribution portion extending perpendicularly from

an end of said first portion of said main fluid passage  
opposite said collar portion, said second distribution  
portion extending perpendicularly from an end of said  
second portion of said main fluid passage opposite said  
5 collar portion.

14. The apparatus recited in claim 13, wherein said  
collar portion comprises:

a first collar part formed at an end of said  
10 first portion of said main fluid passage opposite said  
first distribution portion, said first collar part having  
a semi-cylindrical inner surface;

a second collar part separate from said first  
collar part, said second collar part being formed at an  
15 end of said second portion of said main fluid passage  
opposite said first distribution portion, said second  
collar part having a semi-cylindrical inner surface; and

fastening means for connecting said first and  
second collar parts with each other, said semi-  
20 cylindrical surfaces of said first and second collar  
parts together defining a cylindrical inner surface of  
said collar portion when said first and second collar  
parts are connected with each other.

15. The apparatus recited in claim 14, wherein said first collar part includes an aperture that provides fluid communication with said first portion of said main fluid passage through said inner surface of said first collar portion, and said second collar part includes an aperture that provides fluid communication with said second portion of said main fluid passage through said inner surface of said second collar portion.

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16. The apparatus recited in claim 15, wherein said inflator comprises first and second outlet apertures positioned opposite each other, said aperture of said first collar part being positioned adjacent said first outlet aperture when said collar portion is connected with said inflator, said aperture of said second collar part being positioned adjacent said second outlet aperture when said collar portion is connected with said inflator.

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17. The apparatus recited in claim 2, wherein said first distribution portion directs said inflation fluid in a first direction and said second distribution portion



directs said inflation fluid in a second direction,  
opposite said first direction.

18. The apparatus recited in claim 1, wherein said  
5 inflator comprises an outlet portion for releasing  
inflation fluid to flow from said inflator, said manifold  
comprising a collar portion connectable with said outlet  
portion of said inflator.

10 19. An inflation fluid distribution manifold for  
directing inflation fluid from an inflator to an  
inflatable curtain inflatable away from a vehicle roof  
between a side structure of the vehicle and a vehicle  
occupant, said manifold comprising:

15 a collar portion comprising first and second  
collar parts each having an inner surface, said first and  
second collar parts being connectable with each other  
such that said inner surfaces encircle and engage an  
outlet portion of the inflator to clamp said collar  
20 portion onto the outlet portion of the inflator;

a main fluid passage in fluid communication  
with an inflation fluid outlet of the outlet portion

while said collar portion is clamped onto the outlet portion of the inflator;

5           a first distribution passage in fluid communication with said main fluid passage, said first distribution passage comprising a first flow orifice that helps direct inflation fluid to flow into the inflatable curtain at a first flow rate; and

10           a second distribution passage in fluid communication with said main fluid passage, said second distribution passage comprising a second flow orifice that helps direct inflation fluid to flow into the inflatable curtain at a second flow rate different than said first flow rate.

15           20. The apparatus recited in claim 19, wherein said inner surfaces of said first and second collar parts combine to form a cylindrical clamping surface of said collar portion, said cylindrical clamping surface being in continuous engagement with a cylindrical outer surface  
20 of said outlet portion of said inflator while said collar portion is clamped onto the outlet of the inflator.